

Methods for Analyzing and Comparing Large-Eddy Simulations

Barbara Kornblum and Rose McCallen
Lawrence Livermore National Laboratory
Livermore, California

Wolfgang Kollmann
University of California, Davis
Davis, California

Analysis of three-dimensional (3D), transient, turbulent fluid flows that exhibit complicated vortex shedding patterns is addressed. Large-eddy simulation (LES) of these flows provides 3D, time dependent velocity and pressure fields. The evolution to a 3D state and the approximate periodic nature of these turbulent flows is demonstrated. Power spectrum analysis and flow visualization are used to evaluate the velocity and pressure time histories. The power spectrum results indicate the dominant frequencies and hence, the length scales in the flow. Using this information, both mesh resolution and time step effects are being studied for the backward-facing step.

DISCLAIMER

This work was performed under the auspices of the U.S. Department of Energy by Lawrence Livermore National Laboratory under Contract W-7405-Eng-48.